



## Introduction

The Commander, Navy Region Mid-Atlantic (CNRMA) operates thirteen installations and annexes in the Hampton Roads area, extending from Naval Weapons Station, Yorktown in the north to Naval Support Activity Norfolk Northwest Annex in the southeast. CNRMA employs a workforce of slightly under 6,000 military and civilian personnel. The region provides Base Operating Support (BOS) services to the largest concentration of shore commands and operational surface, air and submarine forces in the Navy to include: 113 home-porting ships, 419 aircraft, and 295 tenant commands. The Region provides three airfields, 49 piers, two fuel terminals, and 64 million square feet of facilities on 29,843 acres to meet the needs of the fleet in Hampton Roads.

Commanding Officer, Navy Public Works Center, Norfolk has been designated by CNRMA as the Regional Facilities and Environmental Program Manager, responsible for providing high-quality, consistent facilities and environmental services to those thirteen installations and annexes through a consolidated staff. The Regional Pollution Prevention (P2) Program for CNRMA falls under the purview of the PWC Regional Environmental Group.

## Background

Environmental protection is an ongoing, critical aspect of the CNRMA mission. Most of the thirteen installations drain into the Chesapeake Bay, the object of a four-state, multimillion dollar restoration effort. DOD manages more shoreline in the area than any other landholder. Additional environmental challenges are presented by a myriad of permits with varied compliance requirements and the constant turnover of military personnel.

The Regional Environmental Group meets these challenges with a matrixed organization composed of media managers responsible for one or more regulatory programs across the entire region and storefront staffs who provide the daily interface with base commands. Pollution prevention is part of everyone's job. P2 media managers are responsible for program direction and oversight, while staffs at each base liaise with clients to introduce new technologies, provide training, and encourage P2. Air, water, tank, hazardous waste and solid waste media managers also have P2 aspects of their jobs. The goal of the recycling program, which also falls within the Regional Environmental Group, is to minimize solid waste disposal costs.

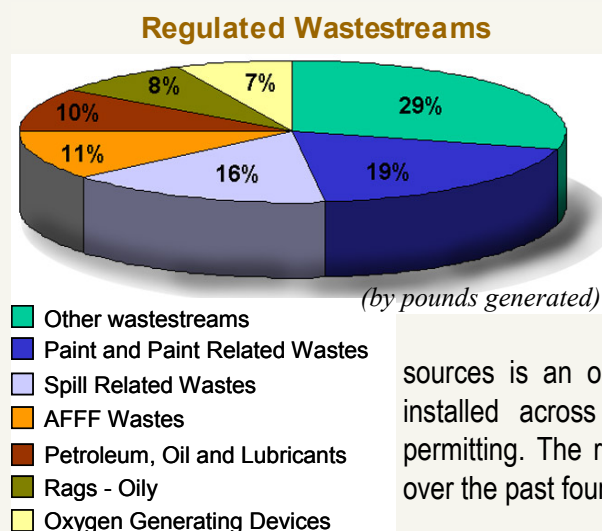
The Regional Environmental Group maintains a close working relationship with the Fleet Industrial Supply Center Norfolk, who, as the Regional Logistics Program Manager, runs a regional Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP) operation and has the lead for affirmative procurement. Each storefront manager has access to the base Installation Commanders for environmental policy and the Regional Environmental Group Head meets regularly with the Regional Commander, RADM David Architzel. A regional EMS policy statement has been developed and a self-evaluation program is ongoing. The region's first external assessment is scheduled for January 2003.

Stakeholders are involved at the highest levels through routine briefings and weekly reports on environmental issues. At lower levels, storefront staffs work with POCs from individual shops to spearhead identification and implementation of P2 projects within their shops, develop associated P2 strategies, encourage waste segregation versus commingling and mixing of wastes, determine disposition of wastes. Quarterly environmental awareness training is offered at every installation to base personnel with environmental responsibilities. Technology-specific training is offered by the P2 media managers to familiarize users with new tools and processes.

## Program Summary

One of the tools utilized to fulfill CNRMA's environmental protection mission is pollution prevention. In general, P2 refers to the implementation of practices or operations that reduce or eliminate the creation of pollutants through process improvements, technology upgrades, use of less toxic materials, and waste recycling/reuse. It is the preferred method of environmental management. One of the first priorities for CNRMA's regional environmental program was to develop a regional P2 plan. This Plan takes advantage of similarities between shops and processes across the region and defines how P2 will be implemented on a continuous basis by both Navy environmental and operations personnel.

In the P2 Plan, less emphasis is placed on P2 data and priority projects while more emphasis is placed on involving the entire CNRMA environmental staff as well as shop/work center personnel in P2. The P2 Plan provides a blueprint for integrating pollution prevention into the management of pollution-generating mission activities and is the cornerstone of the region's evolving Environmental Management System.



Goals of the P2 program have been to decrease the highest volume wastestreams – paints and solvents, to eliminate reporting of releases under the Emergency Planning and Community Right to Know Act, and to minimize sources of air and water pollution. The region has achieved many of these goals. There are now 14 solvent-free maintenance shops in the region. Zero chemicals were reported in 2001 and 2002 as released in excess of threshold quantities. Elimination of air and water pollution sources is an ongoing effort. Over 90 aqueous parts washers have been installed across the region to eliminate solvent usage and reduce air permitting. The region's hazardous waste stream has been reduced by 30% over the past four years.

## Program Accomplishments

Many of the P2 program's accomplishments have been exported to other members of the community through the Virginia-DOD P2 Partnership, the Elizabeth River Project's River Stars program, and other venues. Environmental staff members routinely present case studies of new technologies or processes to technical conferences. The Hampton Roads area is also a popular spot for visitors from DOD, Congressional staffers, and Navy officials from other countries; P2 technologies are highlighted on those visits. Significant accomplishments across the breadth of the program are described below.

## Material Substitution

The Region's strategy for material substitution has been to focus its efforts on new technologies which eliminate the two major waste streams – paint and solvents. In addition, a secondary goal has been to eliminate permitted sources of air and water pollution. The following milestones have been achieved in Fiscal Years 2001 and 2002:

- Replaced PD-680 Type I & II in all 160 Paint Gun Cleaners in the region with non-solvent EP-921, which has eliminated disposal of several thousand pounds of regulated waste and numerous air emission sources.
- Equipped all seven Morale, Welfare, and Recreation auto hobby shops in the region with solvent free brake washers.
- Issued 363 HVLP paint guns in the region, replacing all high pressure and airless units and insuring paint pot size is no more than pint quantity. This greatly reduces emissions and improves air quality in all aviation work spaces.
- Replaced solvent cleaners in all avionics repair operations in the region with six Mini-Max Steam cleaning units. Two of these units are located at the Shore Intermediate Maintenance Activity and provide support in the cleaning of electronic components from ships and submarines.
- Implemented replacement of over 250 lead acid batteries in the region with rechargeable gel-cells. This eliminates disposal of acid from associated processes.
- Introduced Natural Orange or other like non-solvent cleaning products in all 91 Aqueous Parts washers in the region.
- Installed powder coating/cure ovens at two major repair facilities, eliminating wet paint booth operations.
- Replaced aluminum oxide blast units with six Plastic Bead Media Glove Box blast units at two Aircraft Intermediate Maintenance Depot facilities, thus reducing paint/media waste disposal.
- Issued stencil label makers at two locations to reduce aerosol can and stencil paper related waste. The units make computer-generated adhesive back labels for all types of equipment. At one command, this has reduced aerosol can waste by 4500 cans annually and also has the potential to reduce reporting under installation air permits.

As part of the "Solvent Free Shop Program", we now have 14 production repair shops in the region no longer using solvents in their operations. Other initiatives to reduce air pollution include replacing exterior-vented abrasive blasting gloveboxes with interior vent units and providing commands with alternatives to reduce usage of epoxy thinner, MEK, and other Clean Air Act non-compliant aerospace solvents.

## Process Modification or Improvement

The region's P2 media managers have developed several new processes with Navy-wide application. These success stories are shared with other Navy and DOD activities at annual P2 conferences. Three new processes are described below: a vacuum sanding system for paint removal, a laundering process for oil-soaked rags, and a cleaning process for aircraft parking aprons.

### *New vacuum sanding system design for aircraft paint removal*

In May 2002, an industrial hygienist identified a concern with personnel exposure to paint dust generated in aviation hangars. The current orbital-sanders used for aircraft paint removal were the sources of this

dust. The regional P2 staff partnered with Naval Air Engineering Center in Lakehurst, several aircraft squadrons, and the paint sander manufacturer to design an orbital angle sander and shroud housing for existing vacuum pickups. After demonstration and evaluation of the equipment, approval was granted to change the sanding process in the Navy's Corrosion Control Manual. A \$60,000 Pollution Prevention Equipment Program (PPEP) contract was awarded for the manufacture and delivery of 12 kits. The kits were delivered in November 2002.

### **Microbial Laundering of shop towels**

The submarine fleet had been using disposable wipes to clean up oil spills and drips. The annual procurement cost for these wipes was \$750,000 for the entire fleet and \$54,000 for the 12 submarines homeported at Norfolk. The CNRMA P2 media managers piloted a project to use washable shop towels at Naval Station Norfolk and launder them with a special microbial cleaner that uses oil as a food source. This eliminated procurement costs for new wipes and the disposal cost for waste rags. Testing of the microbial cleaner was coordinated with the local regulator, Hampton Roads Sanitation District, to ensure it was effective in destroying the oil.

#### **Return on Investment:**

**Cost of disposable paper wipes** = \$54,000

**Washable shop towels, cost \$ 26.50 per 50 towels.**

**250 towels per annum X 12 Submarines**  
= \$ 1,457

**Microbial cleaner cost per annum** = \$ 1,135

**Total** = \$ 2,592

**Savings** = \$51,408



*This new process allows rags to be reutilized by the submarine fleet*

### **Non-point source storm water management**

Norfolk Naval Station has over 50 Helicopter tie-down spots located on a paved concrete apron that lies adjacent to Willoughby Bay. During heavy rain events, the oil-soaked concrete can become a source of contamination to the Bay. The region has invested in a glycol recovery vehicle that serves a dual purpose. In winter months, it is employed as needed to recover antifreeze if an aircraft requires deicing. In warmer months, the unit is utilized as a scrubber for cleaning oil and grease from tie down spots. This allows full utilization of an \$80,000 asset. The self-propelled scrub, vacuum vehicle cleans a path 50 inches wide and takes 30 minutes to clean and vacuum each tie down spot. The cleaning solution, a mixture of organic compounds and enzymes, is automatically delivered by the scrubber during the cleaning operation and has proven effective as a degreaser and cleaning agent.

### **Improved Material Management**

The Mid-Atlantic Region continues to refine material management procedures to reduce costs and environmental impacts. The Fleet and Industrial Supply Center Norfolk (FISC) supplies hazardous materials to work centers throughout the Region utilizing the Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP). CHRIMP is an intrinsic component of the

Regional P2 program. Hazardous materials are parceled out to the shops on an as needed basis, minimizing storage at the shops and the generation of expired shelf-life materials. Ship and shore customers can also return unused/unopened materials to the FISC reuse store; these materials are offered at no cost to other customers. FISC provides the following services:

- Tracking hazardous material and chemical quantities issued to specific Shops/Work Centers utilizing the Hazardous Substance Management System (HSMS) software;
- Coordinating approval of new hazardous materials for use by a Shop/Work Center; and
- Coordinating with Public Works Center Hazardous Waste to recover unopened hazardous materials turned in for disposal by ship and shore activities.

Another improved material management procedure involves the management of oily rags. In the past, oily rags were collected from the ships as hazardous waste and taken to a storage facility for processing and eventual disposal. Through command cooperation and teamwork, an innovative solution has been implemented. Oily rags are now trucked to the Oil Recovery shop, where they are consolidated into a dumpster. Environmental staff members are negotiating with the Southeastern Public Service Authority (SPSA) for the oily rags to be beneficially used in their Waste to Energy facility. Once these two agencies reach agreement, over 175,000 pounds of oily rags will be diverted from landfills annually, at a cost avoidance estimated at \$110K.

#### **Federal Compliance with EO 13123 “Greening the Government Through Efficient Energy Management,” June 3, 1999**

CNRMA’s two design agents, the Public Works Center Norfolk and the Atlantic Division, Naval Facilities Engineering Command, incorporate energy conservation and sustainable “green building” design concepts in planning and design for new or renovated facilities. The Region is also using financing mechanisms such as Energy Savings Performance Contracts (ESPC) and Demand Side Management (DSM), also known as Utility Energy Services Contracts (UESC), to fund energy conservation projects. Several of these projects are described below:

**ESPC #1. Steam Node project at Naval Amphibious Base Little Creek.** This project, which began in FY-02, will utilize natural gas instead of coal for steam production. Air pollutant reductions include Sulfur Dioxide (SO<sub>2</sub>) by 26 tons per year and Nitrogen Oxide (NO<sub>x</sub>) by 89 tons per year. Annual energy cost savings: \$328,000.

**ESPC #2. Construction of Geothermal Heat Pump.** This project is planned for FY-03 at Naval Air Station Oceana. Total cost is \$7.5M. Annual energy reduction is 251,919 MBTU; annual energy cost savings: \$1.17M.

**DSM #1. Construction of HVAC in Building NH95 at Naval Station Norfolk.** At the completion of this \$4.14M project in FY-03, annual energy reduction will be 28,761 MBTU. Annual energy cost savings: \$221,675.

**Water Conservation Project.** 24 motion sensor faucets have been installed in two buildings at Naval Station Norfolk. Total annual savings are \$83,755. Annual water saving is 4,932 Kgal.



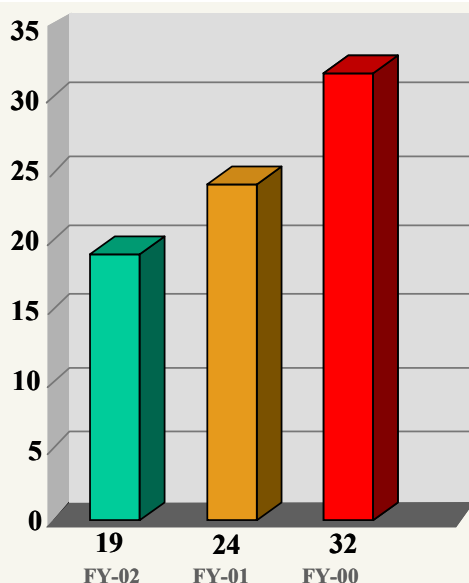
In FY03, a project will be completed to pipe the discharge from a groundwater treatment plant at a Superfund site to the Naval Station steam plant to use as makeup water. This will save 44 million gallons in water per year. Estimated cost avoidance \$358,232.

### **Compliance with Executive Order (EO) 13148, "Greening the Government Through Leadership in Environmental Management," April 26, 2000**

EO 13148 updated reporting, recordkeeping, and notification requirements for the Emergency Planning and Community Right-to-Know Act (EPCRA). No Form R's for chemicals released or shipped off site above threshold quantities were required to be filed for the thirteen installations in the region during CY2001. No Form R's are anticipated for CY2002, either. The last reported chemical was ethylene glycol; the P2 program has provided those users with recycling units to eliminate the waste. New units that will remove particulates and maintain low fluid acid levels will be delivered to six customers in January 2003. The environmental staff has developed an automated EPCRA reporting system that reduces the time required to prepare reports by 55%; CNRMA also participates in Local Emergency Planning Committees.

Section 201 of EO 13148 addressed environmental management. After merging seven separate environmental staffs in 1998, the Region began to build one environmental management program by starting an internal inspection program focused on regulatory and permit requirements. This program,

**CNRMA Regional Environmental Group  
Notice of Violation Reductions**



utilizing standard checklists and conducted by the storefront staffs, has been successful in identifying and resolving many compliance deficiencies in advance of regulatory inspections. The region has experienced a 41% reduction in Notices of Violation from FY2000 to 2002. We are building on our current inspection program by developing formal Internal Assessment Plans, which will be complete for each installation by June 2003. An Environmental Management System Policy statement has been drafted for signature by the Regional Commander, Installation Commanders, and Program Managers. The environmental staff is also piloting Personal Digital Assistants (PDAs) as a method for automating the compliance inspection processes and allowing the data to be reviewed by media managers. Lastly, the Region is investigating Geographical Information System integration for compliance and monitoring.

Another section of the Executive Order establishes goals for reduction of ozone-depleting substances. The Region has developed and distributed standardized compliance procedures for owners/operators of air emission operations and units, including refrigerant and halon handling, to ensure proper management of the remaining ozone - depleting substances in the region.

## **Compliance with Executive Order (EO) 13149, "Greening the Government Through Federal Fleet and Transportation Efficiency," April 21, 2000**

The Public Works Center manages the government vehicle fleet for CNRMA. Almost 5% of the vehicles in inventory are alternative or dual-fueled vehicles. Each year, PWC purchases as many AFVs as are available. The current strategies to reduce petroleum consumption by 20% by the end of 2005 are to purchase more AFVs, replace diesel with biodiesel, and purchase vehicles with higher fuel economy ratings.

### **Recycling**

CNRMA installations are serviced by one regional recycling program which operates five locations across the region. The program processed 5.6 K tons of materials in FY02. Commodities recycled include office paper, corrugated cardboard, scrap metal, batteries, rope, aluminum cans, newspaper, and plastics. In FY02, the recycling program introduced a new method of collecting recyclables, using 90 gallon containers and a specialized truck which dumps the containers into the truck bed. This eliminates the labor-intensive system of collecting individual containers and allows all recyclables to be segregated on conveyor belts at the recovery facility.



*The recycling program uses this automated truck to collect recyclables from all Hampton Roads bases.*

In 2002, a Regional Integrated Solid Waste Management Program was initiated to provide overall management of the solid waste stream in the Region. The goal of this program is to reduce the region's overall costs for solid waste disposal. At Naval Amphibious Base Little Creek, a new transfer station sorts recyclables from trash. This initiative has reduced the solid waste leaving the base by 32%, led to decreased solid waste pickups, and increased the revenue for recycling. A review of the wood recycling contract led to amendments which consolidated pickup points from 11 to six, 40-yard boxes per week. Over a monitored 4-month period, the program recycled over 2,000 pallets, which are picked up by FISC and reutilized.

In another reuse success story, at Naval Weapon Station Yorktown, over 16,000 tons of concrete generated from the demolition of a pier was diverted from landfill disposal. The Virginia Fisheries and Oyster Heritage Program used the concrete for three oyster sanctuary reefs, a key component in restoring a viable oyster population in the Chesapeake Bay.

Waste oil collected throughout the region is transported to FISC Craney Island for blending, then resold to the Public Works Center to use as fuel in the Naval Station steam plant.

### **Affirmative Procurement**

As the Logistics Program Manager, FISC has the lead for affirmative procurement in the region. FISC is responsible for contracting for preferred products under \$100K and the Naval Supply Systems Command contracts for larger buys, such as recycled content copier paper. The environmental staff works with FISC to identify and address specific concerns, such as the requirement for paints with low volatile organic content to meet EPA mandates.

The Pollution Prevention Equipment Program (PPEP) is a CNO centrally funded program that, since its inception in 1995, has provided over \$100 million in OPN support for activities throughout the Navy. The CNRMA environmental staff participates in PPEP team meetings and advocates for the Region. The following are examples of equipment purchased through PPEP:

- A current dry dock operation uses 360 tons of blast media per year. This operation will be converted to a fully enclosed, high-pressure water jet blast vacuum system. This will eliminate all blast media and reduce disposal of paint and non-skid; return on investment for this process change is estimated to be four months.
- A backpack vacuum system is used primarily for paint removal in high places or over water. The system has three attachments: a needle gun for thick paint removal, a 4" sander; and a standard vacuum head. The system pulls paint chips and debris into the vacuum rather than letting them fall on to the deck or into the water.
- The Titan Abrasive Glove Box Blast Unit is an example of the many blast boxes being installed through out the region. The units are used for component de-painting and are fully contained systems with air filtration and media recovery.



*The backpack vacuum systems are widely used in port by ships and submarines.*



*These blast units have replaced unconfined sanding or vented units that were permitted air sources.*



### Education, Outreach, and Partnering

CNRMA has taken an aggressive stance, both in the implementation of new P2 concepts and technologies, and in efforts to be a role model in the community. The environmental program participates in a myriad of local environmental outreach programs, including Earth Day celebrations, the Plant A Tree (Arbor Day) program, Clean the (Chesapeake) Bay Day, and National Public Lands Day. The P2 team has also provided technical assistance to the Elizabeth River Project, a non-profit organization chartered to help restore the Elizabeth River, a tributary to the Chesapeake Bay. The staff shares P2 ideas and concepts with local companies within the watershed. Naval Station Norfolk has achieved the top level in the River Star Program for P2 and habitat restoration initiatives and mentoring efforts.

The Regional Environmental Group also hosts environmental tours for local school children, visiting dignitaries from foreign Navies, and Congressmen and members of their staffs. Several members of the Latvian Defense Department visited the Naval Station for an environmental briefing and tour in January 2002. P2 technologies and success stories are the highlights of these tours. Members of the P2 team regularly share information with their peers through presentations at Navy and EPA conferences.



CNRMA P2 media managers also serve on the Team Submarine Homeport Environmental Focus Group. This group, formed four years ago, is working closely with the submarine designers to create a more environmentally-friendly submarine. One success story from this effort is that the focus group has successfully reduced the amount of required hazardous material to 14 line items compared to over 300 required on the LOS ANGELES class submarine.

In another initiative to share successes with DOD counterparts, CNRMA led the establishment of a Virginia-DOD P2 Partnership. This culminated in a charter-signing ceremony in October 2000 with RADM Christopher Cole, CNRMA, the Virginia Secretary of Natural Resources, and twenty installation commanders or their representatives. The P2 partnership meets two to three times a year to identify opportunities, develop solutions, and promote successes in P2. One goal was to increase member participation in Virginia Naturally 2000 and the EPA Chesapeake Bay Program's Businesses for the Bay (B4B). CNRMA contributions to the B4B program include establishing, implementing, and meeting annual P2 goals, providing P2 and hazardous waste minimization training, and acting as mentors to provide technical assistance to other businesses in the region. The Regional Environmental Group hosted the P2 Partnership's meeting in April 2002 and arranged an agenda and tours focused on the theme of recycling.



*RADM Chris Cole, CNRMA, signs the charter for the Virginia/DOD P2 Partnership at a ceremony in Richmond's Capitol Building.*

For shop/work center POCs, training on P2 technologies directly pertinent to the wide array of processes conducted in the region is a formidable challenge. To address this challenge, the P2 team has initiated training seminars on common Regional processes and P2 technologies/equipment. These include HVLP spray gun painting and cleaning, operation and maintenance of aqueous-based parts washers, and operation and maintenance of "Pressure Island" parts washers. Concurrently, an aggressive training program is in place to inform customer commands of Best Management Practices and approved technologies for painting and paint removal from ships, submarines, and aircraft.

### **Reductions Achieved**

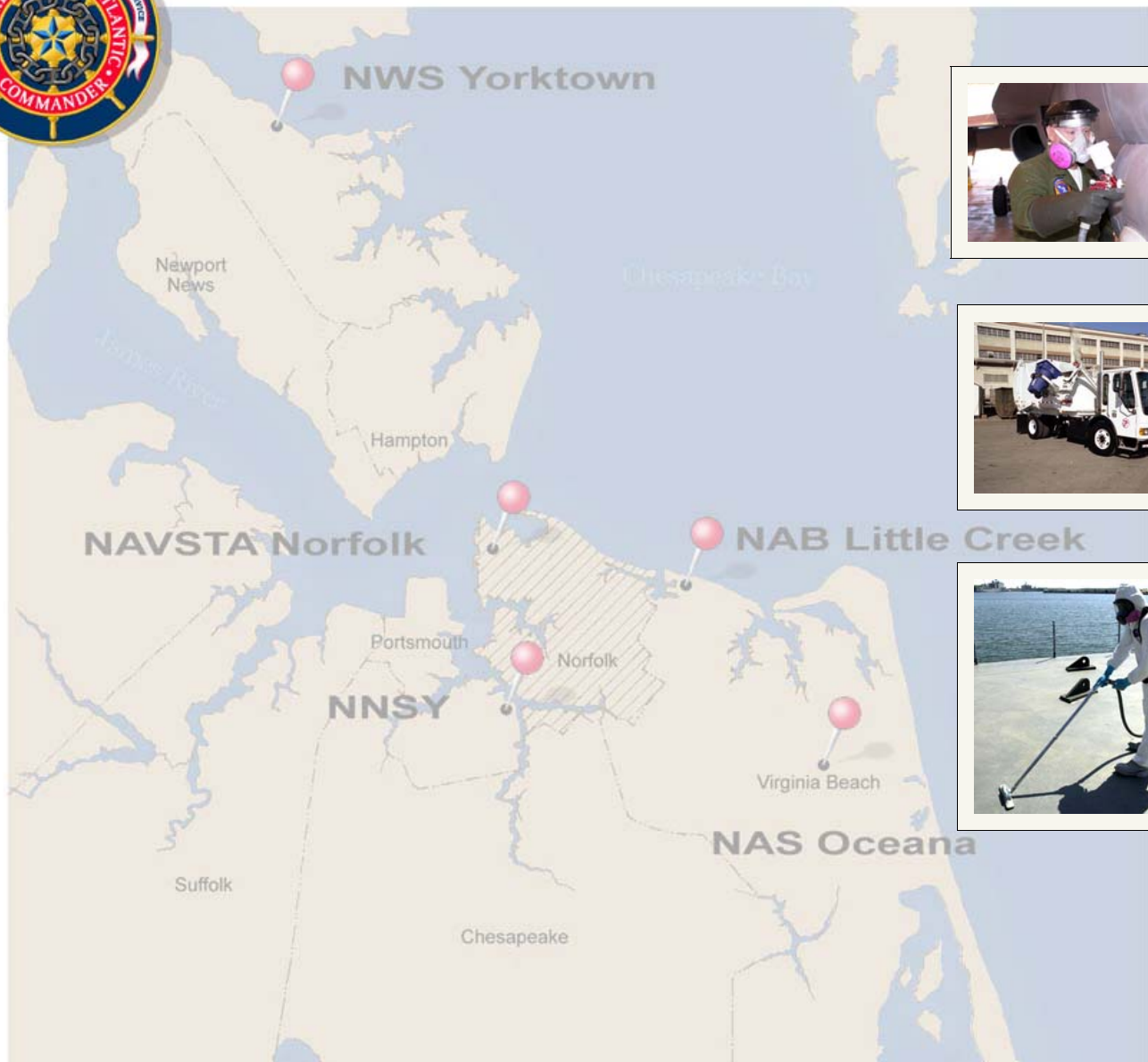
Through teamwork and command support, CNRMA has far exceeded the President's goal of a 50% reduction in toxic chemical releases. From 1994 to 2001, we have achieved an 100% reduction of releases and offsite transfers of toxic chemicals. We have reduced our Right-to-Know reporting burden from 8 chemicals in 1994 to zero chemicals in 2001.

In addition to reducing the usage of toxic chemicals, the environmental staff has also reduced the generation of other types of waste. The P2 program at one installation, Naval Station Norfolk, saves the Navy nearly \$3M million dollars a year. Overall, the P2 Program has decreased the demand for hazardous materials, reduced the volumes of waste requiring disposal, and reduced the Navy's external liability. With outstanding support from Region and tenant commands, each member of the P2 team works hard to implement new initiatives and to identify new opportunities. However, our job is not done, and the team looks forward to the continuing our efforts into the next millennium. We are constantly seeking new opportunities and rising to new challenges at CNRMA.

Secretary of Defense  
FY 2002 Environmental Awards

**POLLUTION PREVENTION**

**NON-INDUSTRIAL INSTALLATIONS**



**COMMANDER NAVY REGION MID-ATLANTIC**